PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Hirohisa Tanaka et al.

Appln. No.: 10/520,068 Group Art Unit: 1754

Filed: January 5, 2005 Examiner: Timothy C. VANOY

For: METHOD FOR PRODUCING PEROVSKITE-TYPE COMPOSITE OXIDE

DECLARATION UNDER 37 C.F.R. § 1.132

United States Patent and Trademark Office
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

I, Kimiyoshi KANEKO, hereby declare and state:

THAT I am a citizen of Japan;

THAT I received a Degree from the Division of Chemistry in the Faculty of Science of Hokkaido University in March, 1969;

THAT I was employed by Hokko Chemical Industry Co., Ltd. from April, 1969, ultimately holding the position of Group Leader of the Fine Ceramics in the Fine Chemicals Development Division, and that I engaged in the development and production of the METHOD FOR PRODUCING PEROVSKITE-TYPE COMPOSITE OXIDE claimed in the present application;

THAT I became a co-inventor of the above-identified application;

THAT I have reviewed the Office Actions of June 5, 2007;

EXAMPLE 1

Preparation of Sr_3NiPtO_6 (Pt content: 31.84 % by weight)

After toluene was distilled off from 55.34 g of toluene solution of strontium isopropoxide (0.0492 mol), a mixed solution containing 213 g of 2-methoxyethanol and 640 g of isopropyl alcohol was added thereto for dissolution. Subsequently, 6.450 g (0.0164 mol) of platinum acetylacetonate was added and the solution was heated at 70°C for three hours.

Then, 4.081 g (0.0164 mol) of nickel acetate tetrahydrate was added and the solution was heated at 70°C for one hour. After the heating, 1.77 g of deionized water was added and the solution was heated at 70°C for two hours.

Thereafter, the resulting mixture was separated from the solvent by distillation, dried in a vacuum at 100°C, and baked at 500°C for three hours or 1000°C for one hour to prepare Sr_3NiPtO_6.

EXAMPLE 2

Preparation of Sr_4PtO_6 (Pt content: 30.41 % by weight)

After toluene was distilled off from 71.99 g of toluene solution of strontium isopropoxide (0.0640 mol), a mixed solution containing 208 g of 2-methoxyethanol and 624 g of isopropyl alcohol was added thereto for dissolution. Subsequently, 6.293 g (0.0160 mol) of platinum acetylacetonate was added and the solution was heated at 70°C for three hours.

Then, 1.77 g of deionized water was added and the solution was heated at 70°C for two hours.

Thereafter, the resulting mixture was separated from the solvent by distillation, dried in a vacuum at 100°C, and baked at 500°C for three hours or 1000°C for one hour to prepare Sr_4PtO_6.

EXAMPLE 3

Preparation of $MgAl_2O_4$ Supporting Sr_3NiPtO_6 (Pt content: 1.25 % by weight)

After toluene was distilled off from 0.562 g of toluene solution of strontium isopropoxide (0.5 mmol), a mixed solution containing 11 g of 2-methoxyethanol and 33 g of isopropyl alcohol was added thereto for dissolution. Subsequently, 0.0657 g (0.167 mmol) of platinum acetylacetonate was added and the solution was heated at 70°C for three hours.

The obtained solution was added dropwise to a suspension prepared by mixing 2.50 g of $MgAl_2O_4$ (specific surface area of 37 m^2/g), 11 g of 2-methoxyethanol and 33 g of isopropyl alcohol, and the suspension was heated at 70°C for one hour. Then, 0.0415 g (0.167 mmol) of nickel acetate tetrahydrate was added thereto and the suspension was heated at 70°C for one hour. After the heating, 0.018 g of deionized water was added and the suspension was heated at 70°C for two hours.

Thereafter, the resulting mixture was separated from the solvent by distillation, dried in a vacuum at 100°C, and baked at 500°C for three hours or 1000°C for one hour to prepare $MgAl_2O_4$ supporting Sr_3NiPtO_6.

EXAMPLE 4

Preparation of $MgAl_2O_4$ Supporting Sr_4PtO_6 (Pt content: 1.25 % by weight)

After toluene was distilled off from 0.751 g of toluene solution of strontium isopropoxide (0.668 mmol), a mixed solution containing 11 g of 2-methoxyethanol and 33 g of isopropyl alcohol was added thereto for dissolution. Subsequently, 0.0657 g (0.167 mmol) of platinum acetylacetonate was added and the solution was heated at 70°C for three hours.

The obtained solution was added dropwise to a suspension prepared by mixing 2.50 g of $MgAl_2O_4$ (specific surface area of 37 m^2/g), 11 g of 2-methoxyethanol and 33 g of isopropyl alcohol, and the suspension was heated at 70°C for one hour. Then, 0.024 g of deionized water was added and the suspension was heated at 70°C for two hours.

Thereafter, the resulting mixture was separated from the solvent by distillation, dried in a vacuum at 100°C, and baked at 500°C for three hours or 1000°C for one hour to prepare $MgAl_2O_4$ supporting Sr_4PtO_6.

EVALUATION

Reduction/Oxidation Treatment

Each powder of Sr_3NiPtO_6, Sr_4PtO_6, $MgAl_2O_4$ supporting Sr_3NiPtO_6 and $MgAl_2O_4$ supporting Sr_4PtO_6 obtained above was subjected to a reduction treatment under a reductive atmosphere (CO: 7.5 %, H_2: 2.5 %, CO_2: 8.0 %, and N_2: Balanced) at 800°C for 1 hour, and subsequently to an oxidation treatment under an atmospheric atmosphere at 800°C for one hour.

X-Ray Diffraction Measurement

Each powder mentioned above was measured by X-ray diffraction. The results are shown below:

1) Sr_3NiPtO_6 (Baking Temperature: 500°C)

After the bake, no crystal structure of Sr_3NiPtO_6 was detected. More specifically, Sr_3NiPtO_6 was not produced through the baking at 500°C.

2) Sr_3NiPtO_6 (Baking Temperature: 1000°C)

After the bake, a crystal structure of Sr_3NiPtO_6 was detected. However, no crystal structure of Sr_3NiPtO_6 was detected after the reduction treatment and the oxidation treatment. More specifically, it seemed that the Sr_3NiPtO_6 was disintegrated after the reduction treatment and the oxidation treatment.

3) Sr_4PtO_6 (Baking Temperature: 500°C)

After the bake, no crystal structure of Sr_4PtO_6 was detected. More specifically, Sr_4PtO_6 was not produced through the baking at 500°C.

4) Sr_4PtO_6 (Baking Temperature: 1000°C)

After the bake, a crystal structure of Sr_4PtO_6 was detected. However, no crystal structure of Sr_4PtO_6 was detected after the reduction treatment and the oxidation treatment. More

specifically, it seemed that the Sr_4PtO_6 was disintegrated after the reduction treatment and the oxidation treatment.

5) $MgAl_2O_4$ supporting Sr_3NiPtO_6 (Baking Temperature: 500°C)

After the bake, no crystal structure of Sr_3NiPtO_6 in $MgAl_2O_4$ supporting Sr_3NiPtO_6 was detected. More specifically, the Sr_3NiPtO_6 was not produced in $MgAl_2O_4$ supporting Sr_3NiPtO_6 through the baking at 500°C.

6) $MgAl_2O_4$ supporting Sr_3NiPtO_6 (Baking Temperature: 1000°C)

After the bake, no crystal structure of Sr_3NiPtO_6 in $MgAl_2O_4$ supporting Sr_3NiPtO_6 was detected. More specifically, Sr_3NiPtO_6 was not produced in $MgAl_2O_4$ supporting Sr_3NiPtO_6 through the baking even at 1000°C.

7) $MgAl_2O_4$ supporting Sr_4PtO_6 (Baking Temperature: 500°C)

After the bake, no crystal structure of Sr_4PtO_6 in $MgAl_2O_4$ supporting Sr_4PtO_6 was detected. More specifically, the Sr_4PtO_6 was not produced in $MgAl_2O_4$ supporting Sr_4PtO_6 through the baking at 500°C.

8) $MgAl_2O_4$ supporting Sr_4PtO_6 (Baking Temperature: 1000°C)

After the bake, no crystal structure of Sr_4PtO_6 in $MgAl_2O_4$ supporting Sr_4PtO_6 was detected. More specifically, the Sr_4PtO_6 was not produced in $MgAl_2O_4$ supporting Sr_4PtO_6 through the baking even at 1000°C.

Draft Declaration Under 37 C.F.R. §1.132
U.S. Application No. 10/520,823

I, the undersigned, declare that all statement made herein on my knowledge are true and that all statements made on information and belief are believed to be true: and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and such willful false statements may jeopardize the validity of the application or any issuing thereon.

Signed this day of October, 2007.

19. October, 2007.

Kimiyoshi Kaneko

Kimiyoshi KANEKO